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The article appearing in this issue of the *Review* is based on a paper delivered before the University of Missouri School of Business and Public Administration Panel on Finance and Insurance during the *1960 Business Week* in April.

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The Article on Arbitration is an adaptation of comments made by Professor Bauder at the Regional Conference on Arbitration of Industrial Disputes sponsored jointly by St. Louis University and Washington University, May 6 and 7, 1960.

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Investment Management In Life Insurance Companies

DeLong H. Monahan
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The fundamental purpose of life insurance is well understood by our adult population. Not so well understood is that, in providing indemnity for lost life values, life insurance companies have become the repository of a large proportion of the savings of individual policyholders, and that these funds have been directed into numerous channels where they play an important part in strengthening the country's productive capacity, in building our national defense, and in making possible an infinite variety of goods and services that continuously improve our standard of living. An examination of the principles and practices of the life insurance investment process should aid in broadening the understanding by the public of the part that the institution of life insurance is playing in our everyday mode of living.

ECONOMIC AND SOCIAL JUSTIFICATION

Life insurance investments must have economic and social justification. Funds placed in private enterprises must be employed in a productive manner to yield goods and services out of which interest and principal repayment will be assured. Some funds are loaned to government, but even these must be backed by potential revenue from taxes or other sources that will assure the lender of repayment of principal and interest.

When economic and social soundness are both present in the same investment, life insurance companies find that such investment redounds more or less automatically to the welfare of the public. There are times, however, when a proposed investment may be fully eligible on economic grounds but has dubious social values that would result in public criticism. Then there are other times when proposed investments have within them the possibility of yielding social values but not on a sound financial basis. Too often this latter type of investment is surrounded with political implications, acceptance of which can endanger the social well-being of those policyholders whose savings are at stake.

Specifically, and as an example, if hard-earned dollars are invested in undertakings that have only social but not economic justification the repayment of these investments can come only from subsidies

or increased taxes or artificially created new money. This can only result in inflation. In other words, economically justified investments constitute a powerful antidote to inflation and are a real service to policyholders and the public.

INVESTIGATION AND ANALYSIS

From the foregoing it should be clear that investigation and analysis of investment opportunities is the very heart of life insurance investment administration. For example, when investments are made in private industry a thorough study of the industry, in which the company issuing the security is engaged, is imperative. This should include an analysis of growth possibilities, an understanding of the nature of the markets for its products, actual and possible competition from other industries, availability of raw materials, dependence on tariffs and other governmental regulations, labor relations, and the like. The position of the company issuing the securities with respect to these same factors must then be considered, as well as its competitive position in the industry. Other pertinent factors necessary of examination include an analysis of the company's financial operations, its capital structure, and its managerial abilities, and also future research and development programs.

Finally, in considering any investment it is important that close legal attention be given to the financial terms and covenants in the legal instrument. The investor must be protected against a deterioration of the company's financial situation and the company must be freed of any impediments to healthy growth and development.

By following these and other principles the life insurance industry has become an effective instrument for collecting and investing policyholders' savings. It has gathered together and pooled the individual small savings of millions of people, it has placed those savings where they have been most useful and productive to the economy and to society, and in so doing it has won from its policy-holders a reputation for integrity that has brought a feeling of security too seldom found in other sectors of our troubled world.

SHIFTS IN INVESTMENTS

In the old days most of our portfolio managers were experts on interest rates, and our analysts concentrated on finding bargains, in terms of yields, in the investment fields in which we concentrated. In those days our investment outlets were largely in the railroad and public utility fields. These were regulated fields. Competition was relatively nonexistent. We bought only senior securities. Our risks were money-rate risks, not business risks. We were lulled into a false sense of security, from which we were awakened only with the onslaught of the Great Depression. Our railroad empire suddenly collapsed, except for our equipment trust holdings. Then we lost our equipment trust market to the savings funds. Today, only 4% of the life industry's assets are invested in railroads as compared with 11% as recently as 20 years ago.

In the last ten years the public utility field has become increasingly unattractive to life insurance companies. The quality of bonds issued by public utilities has distinctly improved as compared with 20 years ago, but their interest yield has become markedly less than that provided by other competitive outlets. Lately, of course, there has been some change in the interest rate trend, but broadly speaking a life insurance company cannot keep competitive with others if it concentrates any considerable part of its investments in the public utility market. We are all having to explore new horizons.

SHIFTS IN INVESTMENT SOURCES

We are all aware of the continuing institutionalization of savings, and we should not be oblivious of the part that corporate and governmental pension funds are playing in that process. Pension funds are more of a threat to the historical market of insurance companies in public utilities than perhaps we realize. Just as the life companies lost their equipment trust market to the savings funds I believe they are in the process of losing their public utility market to the pension funds. And just as their railroad holdings are now down to 4% of assets, I can visualize the possibility that in the next ten years their participation in the public utility field may approach comparable inconsequence.

Pension funds are not faced with the same competitive pressures that are encountered by life companies. The actuarial concepts of each are different. Life companies have contractually obligated themselves to earn a stiplated minimum rate on their policy reserves. And in the event that more income can be earned than the stipulated minimum that excess is returned to the policy-holder, at least by the participating companies. Net cost thus becomes a powerful competitive factor, and life companies are thus put on their mettle to produce the lowest net cost commensurate with safety.

Pension Funds Unique

The situation is entirely different with pension funds. There is no comparable obligation placed on the investment managers of those funds to produce even a minimum earning power. There may exist an actuarial assumption that a certain earning power will be attained. But if it is not obtained nothing is lost to the pensioner. The corporation employing the future pensioner merely has to ante up the difference. Obviously, if that difference becomes too great and occurs too often, the corporation is going to find a new manager for its pension fund. But such pressure will come from the corporation, not from the pensioners. And the corporation may not be too concerned because any ante that it may have to put up is tax-deductible.

The fact of the matter is that the corporations to date have not been called upon for much in the way of deficiency funds, perhaps largely because the interest rates of the last few years, since pension funds came into their own, have been considerably higher than the actuarial assumptions that were incorporated in the plans. Therefore, as a practical matter, pension fund investment managers have been completely willing to make their investment job as simple as possible, and the easy way out has been to invest in the highest quality bonds, and that means that they have concentrated in public utilities and to some extent in industrials, publicly issued. Certainly, in the public utility field, so long as these factors exist, that I have described, they have taken the market away from the life companies.

Effect on Life Companies

All of this means that the life companies are being forced to explore new fields within the areas in which they may legally operate where interest rates are higher. And higher interest rates mean greater risks. The era of the money-rate specialists in life insurance investment circles is over. The era of business risk specialists is with us.

Today our investments are becoming increasingly concentrated in the securities of industry. To invest soundly in the securities of industry we must understand the business risks of competition, we must know manufacturing processes and marketing procedures and practices. We may be statistical experts, but the statistics that are any good measure only the facts of the past. Many experts have tried to apply

statistical measurements to the future, but we all know how wide of the mark almost all of those educated guesses have been. And I think you would agree with me that there are mighty few professional statistical experts who are alive today who know anything about the business risks, or the manufacturing processes or the distribution procedures of any industry, let alone any one company in an industry. At best, the investment managers of today must exercise sound judgment in their determination of the ability of a company so to operate over the next twenty or twenty-five years that it will generate an earning power more than adequate to meet the interest charges on its debt and to retire in full the principal of the debt itself. At worst, if investment managers play only by ear, and use no intellectual judgment, they are completely unworthy of the salaries they collect as trustees for other people's money.

REVIEW OF LONG-TERM MARKETS

Industrial bond financing encompasses a great number of individual industries, each with widely different economic characteristics and problems peculiar to that individual industry alone. However, there are, almost always, certain generally differing characteristics of industrial companies, as contrasted, for example, with electric companies, that must be recognized by both the borrowing corporation and the lender. Thus, industrial companies are exposed to a greater extent to the vicissitudes of competition than the regulated electric companies which serve the public without competition. Accordingly the record shows that the demand for the products of most industrial concerns is less stable than that for kilowatt hours. Similarly, industrial plant location is subject to frequent changes due to labor differentials, transportation costs, change in markets, etc. Moreover, industrial management has to be continually on the alert as to the effects on its competitive position of rapidly changing technology. Working capital strength is most important and requires close analysis. As a result of these broad, differing features, sound industrial financing is characterized by lower debt ratios, shorter maturities, and much more substantial use of sinking funds for debt retirement.

No one knows when a rainy day will hit an industrial company. For this reason, every encouragement should be given the industrial borrower to pay off his debt as quickly as possible, so that he will have credit that he can call upon when that rainy day arrives. Too many direct placement brokers, and not a few life companies, have evidenced a willingness to approve a schedule of debt repayments that is projected into the future far beyond sound reason. A rainy day could be tragic for all concerned.

It is reasonably possible for a commercial banker to gauge his borrower's ability to repay a loan in 3 or 6 months; it definitely involves more risk when a life insurance company thinks it can see its borrower's ability to repay over a 10 year period; and the borrower and the lender are both playing with dynamite when they think in terms of 25, 50, or 100 years. For its sobering influence, I suggest that you dig out a copy of *The Saturday Evening Post* of say 25 years ago, and note the companies that were flush enough to advertise in that medium in those days, and which are today out of existence.

PROSPECTS IN MARGINAL FIELDS

As long term lenders to industry, I would now like to mention several types of investment that I feel are loaded with pitfalls. Plenty of investment possibilities exist where overcapacity in the industry is either not realized or little enough appre-

ciated. Such a situation is present most noticeably in the textile field and among the metal fabricating trades. In both of these fields historically it has been difficult for investment men to separate the forest from the trees. Our better judgment always tells us to avoid long term investment in these industries, but too often we yield to the lure of the particular situation, arguing to ourselves that the rule of thumb may be all right but this particular situation is the exception to the rule.

Nearly every week, too, we are asked to consider investment in companies that are marginal in their industry. Sometimes we think that even though we know they are marginal, there seem to exist certain factors that will assure the continued operation of the marginal company. Perhaps with, let us say, General Electric and Westinghouse Electric blanketing 80% of their industry we would argue that, for Federal Trade reasons, they would never drive out of business the four or five competitors that contribute the other 20% of the industry. Sometimes, if the industry leader reduces its prices only 1% the marginal company would fold its tent. It is certainly most dangerous to study only the figures of the company seeking a loan. Those figures must be compared objectively with those of other companies in the industry before sound decision can be reached.

Another bugaboo pertains to companies where the labor factor is high either as a per cent of sales or as a per cent of the cost of sales. In these days of creeping inflation this can become a factor over which management has little control, and if it gets out of control the earning power of the business has gone.

Then there is the problem of the integrated versus the non-integrated company. There are risks in both, but to me the serious risk occurs when the non-integrated company seeks to borrow money to finance wider integration with no proven management ability that can assure the success of such a venture. A paper-board converter may excel in that field, and he may have all the confidence in the world that he can operate a pulp mill if a life insurance company puts up the funds, but he should be made to prove beyond any question that he will have pulp mill management that has had a proven record in pulp mill operation.

MANAGEMENT—A MAJOR FACTOR

The management problem bothers me too, as I see it, in those holding companies where the emphasis is on control just for control's sake, where five, ten, or fifteen companies all unrelated as to product or industry, or customer, or method of manufacture or distribution are subjected to the whims of a management that simply cannot be cognizant of the problems of each company, especially when times get tough. The life insurance industry is not performing a sound economic function when it invests in that type of management.

We are only bringing grief upon ourselves as well as the borrower when we let him borrow money too easily. As long term lenders we in the life insurance field are sometimes too prone to think only of the long-term requirements of the borrower, and too little of his short-term working capital needs. All of us see plenty of cases where a would-be borrower comes in with elaborate plans for plant expansion. Sometimes, however, investigation shows that he has completely overlooked the fact that that new plant will require plenty of working capital, and he has made no provision for securing it. Sometimes, too, when we explore with him just how much working capital he will need we find his planning processes so weak that inevitably doubt is raised as to the soundness of even his long-term brick and mortar plans.

Then there is the problem of the small company, usually family controlled, that wants to grow, proposes to borrow to do it, and pointblank refuses to sell any equity even when a buyer is available and even though the family would still have a majority control. This type of company wants to have its cake and eat it too. Many of us are waited upon by this type of company, with variations, at least once a week. Some of them look awfully good for a medium term loan, but after working with some of them through the years, I am pretty much convinced that if, at the outset, I am sure that what they need is fundamentally equity money, then I would be well advised to turn down their application to borrow.

Somewhere, as a company grows, there comes a time when family personalities and family financial interests must take a secondary role. If more funds are needed than the family resources can provide, the management must be broad-gauge enough to consider the interests of the outsiders whether those interests take the form of senior money or equity money. If the management cannot cross that psychological hurdle, I don't think it is deserving of my company's funds.

NEED FOR FINANCIAL COUNSEL

I believe it is evident from my remarks that, just as life insurance salesmen deal with people, so do the investment departments of the life insurance companies. Life insurance salesmen cooperate with their clients in preparing a life insurance program that is tailored to the particular needs of the individual client. In the same way we in the investment departments maintain personal contacts with our borrowers, usually on a first name basis, and our loans are tailored to the particular needs of the corporate client.

Corporations are not aggregations of statistics. They are aggregations of human beings. These human beings in their corporate form need financial counsel just as much as they need it in their private personal affairs.

The mutual understanding and respect and treatment that has developed, particularly in the last fifteen years, between corporate borrowers and life insurance investment departments has reached a point now where, in 1958, 87% of all bond investments made by the 28 largest life insurance companies were the result of direct personal negotiation between borrower and lender. The remaining 13% were publicly issued bonds underwritten by investment bankers.

WHAT ABOUT COMMON STOCKS?

Now we come to the subject of common stocks, a form of investment that has created argument among the members of our fraternity in the last ten years out of all proportion to its place as a per cent of assets.

It was primarily the scarcity of investment media at satisfactory yields during the years of World War II that reawakened interest in common stocks for life insurance companies. Insurance company pressure brought about the revision of a number of state laws in the late 1940s, and in 1951 the rigid limitations existent in the New York Law since 1906 were modestly relaxed. The economy of the last ten years has been such that virtually every life insurance company that elected to experiment in common stocks has reported success, although in varying degrees. Dollar profits always intrigue the imagination, and there is no doubt that our imaginative appetites have been whetted.

All of us are familiar with the usual pat arguments in favor of common stock investment, and the arguments against. My comments today are not going to deal with

the arguments as such. Those are largely theoretical. Rather I shall concentrate on the decisions that have resulted from the application of those arguments. To my mind it is the decisions themselves that are the meat of portfolio management of common stocks.

MECHANICAL SYSTEMS

What concerns me is not whether a company is pro common stocks or con common stocks; but, if it is pro common stocks, how it is implementing that decision, and what are its bases for selection of individual securities. I am appalled at the way some investment officers, having made the decision to invest in common stocks, have sold their souls to the devil and proceeded to worship at the shrine of diversification, spelled with a capital D, dollar averaging, and formula timing plans. Why have statistical systems of this type come to replace the appraisal and judgment for which we have been well paid?

It makes me shudder to see a life company decide to enter the common stock field, and then go out and buy one hundred common stocks, picked necessarily pretty much at random, and have the total of those purchases equal, let us say, no more than 1% of the company's assets. This the company calls diversification. But where, I ask, is the investment management? Where is the manpower in the investment department of that company that is going to keep abreast of the developments in each one of those hundred companies so that sound decision can be made at the right time for the sale of individual stocks? One of two things is going to happen. Either an inordinate amount of time is going to be spent by that department on common stocks out of all proportion to the company's overall investments, or the stocks are going to get little supervision, and the company is just going to play the law of averages. In the first case the expense will much more than offset the possible gain, and in the second case the losses will probably equal the gains over a period of years. In neither case has the investment manager justified his salary.

By the same token I don't think an investment manager is very worthy of professional status if he has adopted a dollar averaging plan that has him buy, let us say, 500 shares of General Electric a year for X years. If his investment training and intuitive judgment tell him that at a certain time General Electric is attractive relative to the rest of the market and is a good investment for his company, he should make his total investment then and there, and not spread it out over a period of years. The chances are that next year, when it comes time for the incremental investment, General Electric may be over-priced relative to the rest of the market. Under such conditions, just what has dollar averaging proved? And how much should the investment manager be paid for performing this clerical duty?

The same attitude can be taken toward the life company whose concept of dollar averaging is to put X dollars into the stock market, year in and year out, come hell or high water. That same company would not make a similar dollar allocation in U. S. Government Bonds. Why should it in common stocks? Most companies try to keep flexible as between, let us say, bonds and mortgages, directing the investment as between those categories depending upon their relative attraction at the time. Why do we check our intelligence at the door when we enter the trading floor of the New York Stock Exchange?

And then there is that other statistical monstrosity known as the formula timing plan. Think of the hours and months and years that investment people have spent on that problem trying to find a formula that would short-cut professional brains. And

does anyone know of a plan that really worked? Does anyone know of a plan that has not cost its user real dough in lost profits? Does anyone know of a plan in use by a life company that has resulted in their now being entirely out of common stocks? And are they happy now that they are out of common stocks? And if they are not out, why aren't they?

CONCLUSION

Our profession is one of widening horizons. As competition gets stiffer we are assuming greater risks. We must learn those risks, and understand them. There is no short-cut statistical panacea that is going to relieve us of our duty or our responsibilities. If we are not going to develop and apply professional standards our companies are going to suffer.

The late Chief Justice Charles Evans Hughes once remarked many years ago that life insurance is practically the highest form of trusteeship. We desire always to merit that praise and that evidence of faith. Our standards must always be high. We can be happy in our work only if we can always be proud, and never ashamed, of our accomplishments.

The Arbitration Award: Its Purpose, Use of Precedents and Publication

Russell S. Bauder
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University of Missouri

In grievance arbitration the immediate purpose is to settle some question of application or interpretation of a collective agreement. The role of the arbitrator is created by the terms of the agreement and his job is to answer a question which is stated in the submission statement or in the grievance itself. The arbitrator himself is brought into the process by joint agreement of the employer and the union who have selected him to hear the case.

Two conclusions follow from this arbitration process. First, the arbitrator is not a public official applying some body of public policy to the controversy. Rather, he is providing an answer to a question in terms of a particular collective agreement and the meaning given to it by the parties in their day-to-day relations. He looks to the parties themselves rather than to public law or to what somebody else may have decided in an apparently similar situation. While it is true that the arbitrator cannot require an unlawful solution, the answer to the question submitted to him is to be found in the collective bargaining relationship of the parties. Public law provides only the general framework within which the answer must be found.

The second point is that, if the arbitration process is created by a union and an employer, the award must be written for them. It governs an aspect of their relationship for the time being and becomes a part of the collective agreement in the same sense that a grievance settlement or an exchange of letters become a part of the agreement. What other uses the union or the employer make of the award is for them to decide.

This is not meant to suggest that the parties will not have other uses for awards. They will find many uses, most of which will fall in the area of the personnel management of both employers and unions. Such uses, however, do not come within the province of the arbitrator. It is not his function to tell the parties how to train stewards and supervisors, how to win cases, how to handle grievances, how to improve management, how to improve joint procedures, how and what to negotiate, and so on.

DECISIONS AND PRECEDENTS

Of one thing, however, we may be sure. If a decision provides opportunity for either side to gain an advantage, it will be

used as a precedent. This use is of some significance to arbitrators because what they write may have broader implications than intended. Consequently opinions should avoid sweeping dicta and, as far as possible, find the basis of decision in the facts and circumstances of the particular case being decided.

No doubt either party would be glad to find a windfall in its favor; it also would resent a windfall in the favor of the other side. Part of the criticism of arbitration arises from this sort of risk. In so far as arbitrators are careful to avoid over-generalization, the arbitration process becomes more acceptable.

If the award is for the parties—the union and the employer—how far does it reach in time? The agreements to arbitrate provide that the award shall be "final and binding," but for how long? There is little direct information on practice. However, the principle involved is clear. Most arbitration clauses limit the process to "application and interpretation" of the agreement. Admittedly this is not as restrictive as it appears to be on first reading, but the decisions are made with reference to specific clauses in the agreement. Since both the substantative clauses and the arbitration itself arise out of agreement, awards can be changed by agreement. Presumably the award holds until and unless the language of the interpreted clause is changed. This is a matter for negotiation.

SPECIFIC NATURE OF ARBITRATION

There is no greater sanctity for an arbitration award than for a provision of the agreement because the award itself rests on the agreement. As previously stated, the arbitrator is not declaring a public policy of industrial relations; he is declaring what a specific agreement and specific relationship require in respect to a specific body of fact or evidence. Free collective bargaining requires that the parties determine for themselves the rules of their relationship. While it may be necessary that some interpretations or applications be made by others, it is equally necessary that such decisions be subject to modification in negotiation.

IMPORTANCE OF THE OPINION

Today there is suggestion that arbitration should be simplified and made less costly by dispensing with opinions. Such a development would be unfortunate for several reasons. In the first place, few issues are that simple and few parties present that simple a case. Second, the arbitrator needs to write an opinion to be sure that he is reflecting accurately the evidence and argument. Most arbitrators do not write their opinions to support a predetermined conclusion. Rather they reach their conclusion out of the process of organizing and summarizing the materials submitted to them. Third, the parties have a right to know how the arbitrator reached his conclusion. This helps to understand the decision. Perhaps it aids in preparation of subsequent cases. It also provides a basis for judging the quality of the arbitrator's work. Finally, a decision, correctly supported by an opinion is, or should be, more acceptable.

Should arbitration awards be published? From what has been stated previously, the writer's attitude on this question should be apparent. Whether any particular arbitration case is published is for the parties, and not the arbitrator to decide. This conclusion is based on the belief that the award is the "property" of those who have sought the decision, selected the arbitrator and paid the costs.

From the standpoint of the parties themselves, one can more readily see why they would object to publication than why they would agree to it. Publication is likely to

make one side or the other appear in an undesirable light. On the other hand, the parties may feel that an arbitrator will be more responsible if his work is exposed to the public—actually a public composed of other arbitrators, other unions and other employers. However, when anyone writes for publication, there is the risk that he will have that wider audience in mind and write quite differently than he would if he were writing only for the immediate parties.

USEFULNESS OF PUBLICATION

As far as other people's cases are concerned, it probably is useful to have publication. Most immediately the reported cases do give the parties opportunity to review the work of arbitrators before they are selected to hear cases. While this may have some undesirable consequences, it does permit a judgment on the quality of an arbitrator's work. Few arbitrators have equal competence on all types of cases. If publication is used to help select an arbitrator who has had extensive experience with and has shown competence in a subject area, it is all to the good. Rarely does an arbitrator have enough information about a case he has been requested to hear to permit him to decline on the basis of his lack of familiarity with the problem. Perhaps such self-evaluation is not too reliable anyway.

In addition published cases may be of help to the parties by suggesting lines of argument. A review of related cases may also help perform the role of devil's advocate by exposing weaknesses in one's position.

Quite outside of arbitration itself the published arbitration awards have considerable value as teaching devices. They are used in courses dealing with industrial relations. However, little attention is paid to the decisions in the sense of precedent value. Rather the cases raise specific problems which help students to understand the subject matter of collective bargaining and the interests involved. They provide practice in the analysis of actual situations. No doubt unions and employers could make similar use of the cases in training programs for stewards and supervisors.

When it comes to the significance of published awards as precedents, opinion is divided. The writer believes an award should be reached as far as possible in the framework in which the case is presented. In other words, if the parties want to argue their case in terms of these other decisions, the arbitrator should handle it in that manner. It might be a justifiable inference that such parties wish to copy the practices of others. Certainly if these cases are cited at the hearing and argument is developed from them, it is the duty of the arbitrator to look into the cases to see if he can discover from conflicting opinions the "weight of precedent." Such study is necessarily time consuming and costly to the parties. One way to reduce the cost of arbitration is to limit citations of other decisions to those which are considered to be of actual precedent significance.

This is not meant to imply that there is no use for precedent in grievance arbitration. Earlier decisions on the same clauses of the same agreement have precedent value if for no other reasons than the economizing on arbitration and the preservation of the integrity of the arbitration process itself. Most arbitrators would be very hesitant to upset a prior decision on an identical matter. At least they would have to be convinced that a substantial error had been made.

Beyond the confines of a given agreement there are at least a few places where reference to other decisions or other principles are appropriate. One of these might be where cannons of interpretation are involved. Here, arbitrators should prefer use of cannons evolved out of arbitration to

cannons applicable to commercial contracts. It may sometimes be wise to remind an arbitrator of some of these things.

Precedent or what is related to precedent may also be valuable where it is necessary to fit an award into the framework of law. Where legal questions are elements in an issue, citations of relevant statutes, administrative rulings and court decisions certainly are appropriate and necessary.

No doubt there are other appropriate uses of precedent. However, if these other decisions are only persuasive in terms of criteria used and reasoning followed, it should be equally effective if the parties incorporated the criteria and reasoning in their own argument.

CONSENT IN COLLECTIVE BARGAINING

As a student of industrial relations the writer does not believe it is likely that arbitration will develop a "common law" applicable to agreements generally. Further, if such a development should take place, it might very possibly mean the end of private, voluntary arbitration and perhaps even of collective bargaining. The basic arguments for free collective bargaining rest, first, on the idea of consent and, second, on the idea of flexibility.

Consent means that we look into the specific union-employer relationship to find its meaning. In general language we look to the intent of the parties themselves and not to the intent of someone else. If an award is consistent with intent as shown by the agreement and the practices under it, we may properly take the position that it does rest on consent even if the parties have been in disagreement about it. Consent makes for acceptability and acceptability makes for useability.

Flexibility means that the parties are free to make their rules and administer them in ways that fit their own necessities. Different circumstances give rise to different rules and different applications of rules which read much alike. This is in contrast to the nature of legislation which applies the same rules in the same way to all. Under legislation we must adapt our behavior to the rules. Under collective bargaining we can adapt the rules and their interpretation to our own situation.

Should we adopt a "common law" type of interpretation of collective bargaining rules, it would tend to produce greater uniformity. Uniformity of this kind tends to become public policy. Those who expect the development of a common law of industrial relations base their thinking on the analogy of the evolution of the Anglo-American common law. In this evolution judges decided controversies with reference to local custom. In time decisions were made by comparison with earlier decisions. The local customs that seemed "good" became precedent and law. Much found its way into legislation.

If arbitration decisions do become a body of common law and do come to express public policy, does it not mean that the adjudication of grievances must also move into the public sphere with labor courts or something similar? Can we have a common law administered privately? Adjudication of grievances by a public agency would bring private grievance arbitration to an end.

If we go the next step and these rules get expressed in legislation, increasingly the rules will be substantative in nature. The area left to free collective bargaining will narrow and government may possibly take over the function of making and administering the rules of the employer-union-employee relationship.

If this is what employers and unions want, arbitrators should not interpose objections. If they do, they will be accused of engaging in featherbedding.

Brief History of Trade Development On The Mississippi River System

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INTRODUCTION

The subject of trade development on the Mississippi River System (See Fig. 1), although at first glance mostly a matter of statistics, cannot be adequately considered from any such narrow approach. This is true because any question concerning present volume of trade is generally raised due to interest in what it is going to be or, less often, what it has been in the past. Often the real question, though not stated, is what part does this volume of trade play in the overall economic life of the nation? To illustrate this last, it may be said that the importance of trade on the Mississippi has ranged, over recorded history, from being the very economic life-line for the nation, in the packet-boat days, to utterly insignificant in its effect upon the nation's economy, as in World War I, when the Director-General of Railroads, acting under the authority granted in the "Federal Control Act" of March 21, 1918, initiated the Mississippi-Warrior Service, the forerunner of the Federal Barge Lines.

*The views advanced in this paper, as well as the interpretations placed on facts and events, are Mr. Carey's.

In addition to the statistical approach then, the historical background of overall development is of interest, including mention of the political maneuvers of the nations whose statesmen recognized the potentialities of the Mississippi River System. Finally, the development must be discussed in the light of three governing factors, namely, (1) the growth of the trade in parallel with (2) the physical inprovements of the river system which (3) govern the dimensions and operational characteristics of the cargo-carrying equipment and therefore, the overall ability of the Mississippi River System, or its component members, to compete with other water systems or other forms of transportation. When thus viewed, the final statistical presentation of the volume of trade on the Mississippi River System becomes not only more interesting, but more meaningful, to commercial interests or others as an index of the magnitude and nature of further growth to come.

RESUME OF POLITICAL HISTORY

Strictly speaking, the political history of trade development on the Mississippi River System would involve; first, the inter-

MISSISSIPPI RIVER SYSTEM NAVIGATION PROJECTS

SCALE IN MILES
50 0 100 200 300

Fig. 1
U. S. Army Engineer Division, Lower Mississippi Valley

tribal trade arrangements of native Indians; second, the moves of the several European nations who recognized the potentialities of this great river valley and attempted to acquire it; and third, the part of the United States of America in acquiring and holding the Mississippi River System. Little is known of the Indian trade; hence, the "political history" treated here will be that of the major moves of Spain, France, Britain, and the United States.

Early Recognition of Potentialities.

Imperial Spain and Imperial France early recognized the strategic and economic significance of the Mississippi River System. Spain had some concept of the extent of the Mississippi Valley very early as a result of two exploratory expeditions; namely, that of DeSoto (1539-1542) from Florida to the Mississippi, and that of Coronado (1540-1542) from Mexico into the Great Plains and the far reaches of two of the principal western tributaries. DeSoto gathered information on several tributaries; the Yazoo, White, Arkansas, Ouachita and Red, while Coronado acquired knowledge of the western reaches of the Red and the Arkansas, and perhaps gathered rumors of another great tributary, the Missouri. The French exhibited an early interest in the Mississippi as a result of several expeditions down the river by their early explorers, LaSalle in particular in 1682, and some reconnaissance work along the Gulf of Mexico by several of their navigators, notably Laudonniere in 1564 and again LaSalle in 1684. It is possible that some of Queen Elizabeth's Captain-Statemen had some knowledge of the existence of this great river and its valley, and may have contemplated some action in the early days. However, they were too busy attacking Spain in Central and nearby South America and in intercepting and plundering the returning treasure-laden galleons.

French Control.

The French finally made an important move to "control" trade on the Mississippi and to "channel" it into their own hands when, in 1718, they laid out and established New Orleans, to be the principal port and the capitol of the immense area known as Louisiana. Several settlements had been established earlier, of course, in what is now Louisiana and along the Gulf as far east as Mobile; including several early settlements which were destroyed by the Spaniards. In all this, it is important to note that the prime objective was not settlement, but trade, and the fur trade in particular.

Concerning this last, it is interesting to observe that, almost from the first, English colonists from the Carolinas and Virginia intercepted and took much of this trade from the French, as far west as and even beyond the Mississippi, and caused it to move from west to east in an overland direction to their Atlantic Coast settlements. Although "overland" the traffic actually followed waterways, with portages over the divides; the routes being used first, of course, to carry goods westward to be used in bartering for the furs. Thus, these colonists were able to partially nullify the value of the great Mississippi River to the French. Further north, other colonists, from New York and Pennsylvania, had been able similarly to divert furs from the Missouri Country and cause them to move to Albany, New York and other points; in this case, offsetting the control by the French of the Great Lakes and the St. Lawrence. It is important to note that this trade, carried in hand-propelled freight canoes or large oar-propelled craft, was so important that it was a major contributing cause for war; in fact, during much of the time it was carried on in an atmosphere of war.

As an indication of the dynamic situation then prevailing, it is interesting to note

that when Bienville, with some troops from New Orleans, landed on the north shore of Lake Pontchartrain he encountered Choctaw Indians who asked for assistance against attacking Cherokees, led by English-speaking white settlers from the Carolinas. This incident, in the light of the remarks above, was added prophecy for the future of Louisiana, and probably Texas for that matter, for it seemed already in the cards that English-speaking people would finally take over. This augury was again supported when it was found impossible, under the Spanish regime in Louisiana, to control English-speaking settlers who had been imported into Northern Louisiana in the vicinity of Bastrop. It was from this latter point, or area, of vantage that the later descent upon Texas took place. One more point of interest is that Bienville's New Orleans expedition was more properly "Canadian" than "French," since he and many of his troops were actually born in Canada; that is, New Orleans was founded by Canadians, rather than simply by "the French."

The British Effort to Control.

The threat to the English-speaking settlements in North America, arising from the French (or Spanish) control or possession of the Mississippi, was plain to British and colonial statesmen. Naturally, this continued to be clear to Washington, Burr, Jefferson, and others when they became American, instead of colonial, statesmen. Jefferson, was animated by this old fear when he sent Monroe and Livingston to France to negotiate for the purchase of the "Isle of Orleans"; that is, the territory east of the Mississippi River, south of Bayou Manchac (near Baton Rouge) and south of Lakes Maurepas and Pontchartrain. Napoleon, in the course of the negotiations, offered the Americans a "bargain"—He would sell all of "Louisiana," extending to the Rocky Mountains and Canada, for the sum of $15 million. This transaction put an end to the long time intention of France to control the Mississippi and left only the British challenge.

The British were early aware of the trade significance of the Mississippi River System, including its mouth. Their later acquisition of West Florida, bordering on the Mississippi, and their efforts to retain that area (with its influential United Empire Loyalist element) are clear indications of the continuing importance they attached to the river. This recognition was also manifested in the 1783 treaty, recognizing the independence of the former 13 colonies, which stipulated that Britain (i.e., Canada) had the right to navigate the Mississippi River ". . . from the source to the ocean." The loss of the Battle of New Orleans thwarted a British attempt to control the Mississippi; the last in a long history of attempts by European nations.

The conventional view is that the Battle of New Orleans was of no significance because it was fought after the Treaty of Peace was concluded. When the battle is viewed in the light of all the pertinent conditions, this conclusion is difficult to accept, since it involves an entire series of unlikely propositions. This was the reaction of two army officers assigned in that general area of the United States from 1926 to 1932; the late Col. Henry Richmond, Cavalry, in charge of reserve work in Louisiana, and the late Lieut. General John C. H. Lee, then assigned as District Engineer, U. S. Army Engineer District at Vicksburg, Mississippi. As soldiers they looked over the Chalmette battlefield and reviewed the accounts of the battle. Immediately they found it difficult to credit the view that the battle was of no significance. This led to more serious research and, as they explored the matter further, it became more and more difficult to credit the generally accepted view. Finally, on the basis of their research, they concluded that, had the British won, New Orleans and some or all of the Louisiana Purchase would have been

British from that point on in history. Colonel Richmond is known to have set forth this thesis in an address made to National Guard and Reserve Officers. Major General Raymond H. Fleming, one time Chief of the National Guard Bureau, Department of Defense, and for many years Adjutant General of the State of Louisiana, recalls hearing this talk on several occasions and his repeated urging on Colonel Richmond that the talk be published. Lieut. General John C. H. Lee, the other officer, told the author of this paper of the results of their studies.

Although, in preparing this paper, the author spent considerable time in the New Orleans Public Library trying to parallel the research of these two officers, he was unable to find any specific item of record that of itself would refute the accepted notion that this greatest victory for American arms in the War of 1812 (and greatest defeat for Britain) has no historical significance. What does develop, however, when all the existing military and political conditions are considered, along with the known attitudes of the sharply opposing interests in both countries, is the overall conclusion that had the British won the battle, as their long and thorough preparations gave them every right to expect, New Orleans and some or all of the Louisiana Purchase would have been held by Britain as the spoil of war. And further, it is apparent that the United States, at that time, would not have been able to muster any military force capable of ousting the British, who were then blockading every port in the United States and controlled every sea in the world.

To accept the long held view of the significance of this battle necessitates discounting various British actions and attitudes that are at variance with it. Thus it is necessary to believe that the British would risk having the veterans of Wellington's glorious Peninsula Campaign against Napoleon die for no purpose in the swamps of Louisiana. Then there is the British view that the sale of Louisiana by Napoleon was a "forced sale" to prevent British capture. It is also known that the British were smarting from military setbacks received at American hands, particularly the inroads on their commerce by American privateers. The British were smarting too from what they considered an unfair attack upon them when they were attempting to crush Napoleon, who, as a would-be world conqueror, was only a somewhat refined version of a Hitler of another day. From the account of the naval engagement at Fayal, Azores, September 26, 1814, it is known that the preparations for this great expedition were then well advanced; that is, preparations for the New Orleans expedition seem to have paralleled, in time, the negotiations for the Treaty of Ghent. The treaty negotiations were most surprisingly long drawn out. The British seemed to have much difficulty making up their minds whether they wanted peace or something else not stated. There was "backing and filling" on the part of the American Delegates too, but this resulted from understandable sectional conflicts of interest. The apparent British confusion of aims can be easily resolved on the basis that the success of the great expedition to seize the strategic mouth of the Mississippi would enable them to present the Peace Conference with "an accomplished fact."

If such a re-appraisal of the Battle of New Orleans can be sustained, it follows that this battle takes its place after Saratoga as the second most decisive battle in American history; that is, where Saratoga determined that there would be an independent country from the Atlantic ocean to the Mississippi, New Orleans determined that there would be a great empire extending from the Atlantic to the Pacific. The Battle of New Orleans would then be seen as winning the last, and most important, battle of the war. In addition to compensating for the gross mishandling of

the war and a lengthy list of defeats, the result of the battle could then be expressed as one authority on Louisiana history puts it "The Battle of New Orleans set the seal on the Louisiana Purchase."

Andrew Jackson, as a "Westerner," had an even better appreciation of the importance of the mouth of the Mississippi than his contemporaries in the East. Thus, the significance of the impending battle was always clear as crystal to him. His imaginativeness and ruthlessness first in organizing, and then in conducting, the defense of New Orleans provide the real explanation for the fact that America, and not Britain, held this area after the battle. There were few limits on Jackson's will to win; recently he had invaded the territory of "neutral" Spain; first, he threatened to hang the Pirate Lafitte and then he recruited the Pirate and his entire crew; and finally, he did not hesitate to threaten to jail the Federal Judge at New Orleans if he got in the way. Certainly he knew what he intended to do, as did the British know what they intended to do, even if the United States, under the vacillating Madison, did not fully appreciate the situation. Here then, on the field of Chalmette, was ended the last foreign threat against the mouth of the Mississippi and the control of trade on the Mississippi River System.

DEVELOPMENT OF TRADE

In studying trade development on the Mississippi River System, it must first be noted that this development has been in parallel with, and dependent upon, the physical navigation improvements made by the U.S.A. Step by step, as a better waterway was provided, technological developments in river carrying-equipment took advantage of the improved channel and used it to limits of its governing dimen-

Fig. 2
M. V. "MARK EASTIN"—6 Barges, 20,000 Tons of Coal
U. S. Army Engineer District, Vicksburg

sions. The actual "capacity" of the waterway has always been practically unlimited, except perhaps in some tributary reaches where the capacity of locks, as to size of vessels or tows or as to number of lockages per day, might be the governing factor. As a hypothetical measure of "capacity," it may be stated that the main-stem Mississippi River today could probably carry, in modern tows (Fig. 2), all the tonnage of all the north-south railroads from Chattanooga, Tenn., west to Kansas City, Mo., and have no traffic congestion problem.

Inter-Tribal Indian Trade.

There was undoubtedly well-developed barter commerce between the various Indian tribes. That is, despite the popular concept of the Indians as being perpetually on the warpath, there actually were long periods of peace during which certain limited and mutually advantageous barter was carried on. There had to be such periods of peace, or the Indians could easily have starved.

As two concrete instances of greatly-sought-after materials, readily available for trade in volumes well above the ability of the producers to consume themselves, the following are cited: The first item is a deposit of flint-like material near Hot Springs, Arkansas, not far from the Ouachita River. The Indians developed this on a substantial scale; making arrow heads, tomahawk blades, etc., for themselves and as articles for trade with the tribes in the lowlands to the south, where there were no similar deposits and negligible other sources of flint or flint-like material for essential war and peace utensils. They also quarried the material in blocks for the "wholesale" trade, or for use by "do-it-yourself" Indians.

The question arose, in looking at this quarry, what did these Indians want from the southern lowlanders? Recently the author's attention has been drawn to the fact that the Avery Island Salt-Dome, in sight of the Gulf of Mexico, was operated on a "commercial" scale by Indians or others preceding the white man. There they mined the salt, instead of simply using the brine, as the first white men did. They also made special pottery containers for the salt, as testified to by the recovered intact vessels and the many broken fragments. There is no salt available at Hot Springs, hence here is a basis for inter-tribal traffic; arrowheads, tomahawks and do-it-yourself flint blocks from Hot Springs, Ark., to Louisiana, and salt in pottery containers from Louisiana to Hot Springs, Ark. Other similar combinations of surpluses and unfilled needs probably created commerce between Indian tribes on a correspondingly limited scale at many, many other points on the Mississippi River System. Physical improvements were undertaken too; such as, cleared "portages" across certain narrow necks, where it was easier, in going upstream, to carry the canoe and the trade products distances up to a mile or so, rather than to engage in tough upstream paddling for 15 to 20 miles.

Pre-Packetboat Trade.

The white man's pre-Packetboat trade was carried first in large freight canoes, probably at least four paddlers on each side; that is, in craft similar in shape and dimensions to those used in northern Canada on construction, surveying, logging and by the Hudson Bay Company in remote areas up to World War I and beyond. Another craft probably used was the pointed bow multi-oared type of craft. Next came the "keelboat" and the "flatboat"; the latter, in particular, generally useful only for down-river traffic and to be sold for lumber at the end of the trip.

The Packetboat Trade.

The first steamboat on the Mississippi River System was the "New Orleans." It was built by Nicholas Roosevelt to the impractical designs of Robert Fulton. It

reached New Orleans on Jan. 10, 1812 after traveling the Ohio and Mississippi. The "New Orleans" was never able to get back up the river any farther than Natchez, Miss. It was a vessel of essentially ocean-going design unsuited to service on the Mississippi. The first steamboat to go from the Ohio to New Orleans and return (Dec. 1814-May 1815) was the "Enterprise," designed, constructed, and piloted by Capt. Henry M. Shreve. This man conceived and designed practically every feature of the Mississippi River type packetboat that was to dominate traffic on the western rivers for 100 years; the type of engine, the type of boiler, the general structure of the vessel with deck upon deck. The "Enterprise" was somewhat underpowered and so Shreve immediately went to work on the "Washington." This latter vessel left Louisville, Ky., Sept. 24, 1816, and arrived at New Orleans, October 7, 1816. It then proceeded to make the round trip in 25 days and the Steamboat Era was well underway. Following this Shreve built a still faster and better boat, the "George Washington," which was practically a luxury vessel.

Shreve's trip on the Enterprise in December 1814 was historic: In the first place, he brought certain ordnance and ammunition for General Jackson's troops that were vitally essential to winning the Battle of New Orleans. Then he turned the vessel back and went up river looking for four flat boats of munitions for Jackson. He found them at Natchez, "hooked into them" in the most approved towboat fashion (The first such tow ever made), and brought them to Jackson. Then he ran the Enterprise below New Orleans past British gun emplacements on both banks, and brought sorely needed ammunition to Fort St. Phillip which was being bombarded by a British fleet.

A major contribution by Shreve in initiating the Steamboat Era, practically single-handed, was his throwing into confusion, and finally breaking the monopoly which Livingston and Fulton had secured from the territorial legislature of Louisiana, giving them the sole right to operate Steamboats on the Mississippi River.

After Capt. Shreve had once blazed the way, the traffic and the necessary carrying equipment grew rapidly. Luxury soon appeared unequalled perhaps on any floating craft anywhere in the world. Speed was soon introduced that has only recently been equalled in river traffic. Competition was keen; that is, straightforward and rugged. As an index of the aggressive spirit prevailing, it is interesting to note that the vessels almost immediately ran night and day—a river operating technique up to recently only a matter for discussion on the Rhine in Europe. Before too soon, however, the paralleling railroads and the East-West railroad lines, in their different ways, were using low rates on traffic in selected categories to ruin the Packetboats, while for the other categories, the rule was "charge what the traffic will bear." This went on until, by 1920, the Packetboat was no more. In passing, it may be observed that the earliest railroads were built as feeders to the river traffic; this was the case with the line built in the 1840's from Woodville, Miss., to Bayou Sara, La., and the Clinton and Port Hudson Railroad in Louisiana, among others.

The Packetboat was a self-propelled freight and passenger carrier that ran at a good rate of speed. A later, but parallel, development, was the "towboat" (Fig. 3) which shoved (i.e., "towed") a number of loaded barges. The towboat was similar to the packetboat in general design but had greater power and was equipped at the bow to tie into a tow of barges. This method of "shoving," instead of "towing on Hawsers," is peculiar to the Mississippi and results in equipment capable of carrying the maximum of cargo with the lowest investment and operating costs and with the smallest possible crew. Towboats travelled at slower speeds than packetboats. By 1920

Fig. 3
M. V. "ESSO LOUISIANA"
"Integrated" Tow, 5 Barges, 88,000 Bbls. of Refined Oil
U. S. Army Engineer District, Vicksburg

this towboat traffic had also virtually ceased. Even the heavy coal traffic from the Ohio, handled by great companies in their own equipment, had ceased for reasons that are not clear.

Post Packetboat Trade.

This was the dismal state of affairs prevailing on the Mississippi when, under the spurring of a war, the "Mississippi Warrior Service" was inaugurated in 1918 by the Director-General of Railroads. By 1924, it was evident to the Congress that such a business could best be handled under the same form of organization as a private business. Accordingly, the Act of June 3, 1924, set up a "Delaware Corporation" known as the "Inland Waterways Corporation," all the stock of which was owned by the Federal Government. It's mission was to organize the "Federal Barge Lines" and to do everything necessary to extend its services. The Act also provided the legal machinery for getting the Government out of this business when the mission of restoring traffic on the Mississippi System had been accomplished.

Operations were commenced in 1918 with an assortment of borrowed and rented equipment. In the meantime, the "Experimental Towboat Board" set up under the July 27, 1916 River and Harbor Act continued its appointed task of "developing the most efficient types of towboats and barges." The results of these experiments provided the basis for designing modern towboats and barges. The twin-screw tunnel-type Steamer "Natchez" was the first such vessel constructed. This vessel, which made its maiden trip in 1921, was the precursor to modern barge towing and all associated innovations down to the

Fig. 4
M. V. "HARRY TRUMAN"
A Fully Integrated Tow—(Full Load 11,000 Tons of Freight)
U. S. Army Engineer District, New Orleans

present day "Integrated Tow" as exemplified by Federal Barge Lines' M.V. "Harry Truman" (Fig. 4.). Except for a special "bow" barge, the latter consists of plain rectangular barges, of assorted convenient sizes, which fit together, and to the towboat, so as to give a long and narrow (54′ x 1200′) "hull" with smooth continuous lines similar to a lake freighter (and with correspondingly low resistance.) The towboat has twin-screw Diesel propulsion and all modern aids to navigation including pilothouse engine control. Although the "Harry Truman" is "integrated" with its tow, current prevailing opinion seems to feel that the additional gain in efficiency, over simply integrating the tow itself, is scarcely worth certain accompanying disadvantages.

The first activities were initiated by an Army officer and a handful of employees. This "cadre" proceeded to carry through every necessary step, in every related category of activity; including designing, building, and operating barges, towboats and terminals, and concurrent actions in the courts to force the railroads to grant fair joint rates. All this was done with such effectiveness that, by the mid 1920's, traffic was definitely back on the river. By 1935, "Federal Barge Lines" was going strong, carrying out its mission, not necessarily to make money but to pioneer traffic back on the main Mississippi and on certain major tributaries.

By this time, outsiders, oldtimers and others saw that the Federal Barge Line was good, and that others could take what the barge line had provided in new equipment developments, terminals, rates, practices, etc., and proceed from there to "make money." Soon water carrier interests were building modern tunnel-type screw-propelled compact vessels and cargo barges with low towing resistance. Next they abandoned steam and turned to Diesel, with pilot-house engine control, local and ship-to-shore radio, sonic sounder to keep off the shoals, radar to operate in fog and better at night, smaller crews, more power on more propellers and more tonnage. The integrated tow in various forms has reduced towing resistance still further and has increased speed, until speed, as a feature of river navigation, is here—up-river speeds with heavy tows up to 10 m.p.h. in swift current. Improved steering and maneuverability, along with sonic-sounder, radar and radio, have reduced the historic river dangers and delays, despite larger and faster tows, almost to the vanishing point.

Then came the time to consider "Getting the government out of business!" At first some "fast work" was tried and private operators might have taken over only the very profitable part of the business. This move failed. Finally, on July 1, 1953, a fair contract was negotiated by the Secretary of Commerce which, after approval by the President of the United States, turned the Federal Barge Lines over to a private concern. The name "Federal Barge Lines" had acquired such prestige over the years that this concern asked and received permission to continue the same name. The agreement included specific undertakings to continue certain pioneering work; notably to keep operating on the Missouri and to continue the "Express Less-than-Bargeload" service.

There was no socialism in Federal Barge Lines! There were no demands on the general taxpayer comparable with those for America's two "public power" schemes; where in one case, the general taxpayer subsidizes a particular "geographical area" and in the other case subsidizes a particular "economic class." This is the classic instance illustrating the proper part government has to play on occasions in new developments, and it is equally the classic instance of government getting out of such a business at the precisely correct moment. The Federal Barge Lines, a government created and operated agency, brought traffic back on the Mississippi River—make no mistake about that!

OVERALL DEVELOPMENT OF THE WATERWAY

The overall development of the Mississippi River System, as a major avenue of trade, involves the continuing coordinated application of technological developments in plant and methods for channel construction and maintenance, on the one hand, and the parallel technological developments in transportation equipment (i.e., towboats, barges, and cargo-handling machinery) on the other. The following passing references will throw the spotlight on the names associated with some important developments: First, there was Nicholas Roosevelt who with Captain Shreve may be said to have commenced the steamboat era. Shreve also comes in for further mention for devising (and operating for many years) that vitally necessary device, the snagboat, and again for removing the Red River Raft, and still again for making the first Mississippi River cutoffs (i.e., two in the vicinity of Old River.) Next, there is Capt. James B. Eads, who, after two full professional careers (i.e., salvaging wrecks, and promoting, designing, and building the St. Louis bridge), improved South Pass at the mouth of the Mississippi for deep draft navigation by his jetty system, and is later found, as a member of the Mississippi River Commission, proposing improvement of the

Fig. 5
REVETTED BEND
(Levee in Background)—U. S. Army Engineer District, Memphis

Mississippi for a 15-foot channel. During the Civil War, Eads, single-handedly, promoted, designed and constructed the river-going iron-clad battleships, without which the Union side might not have been able to break the South's blockade of the Mississippi. When the Union forces proved themselves incapable of operating these vessels effectively, Eads was called back once more to do this; which he did with complete success. Then there is Theodore Roosevelt, whose "Inland Waterways Commission" report to Congress dated 26 February 1908 blazed the way for comprehensive river-basin planning and provided the basic philosophy underlying various acts of Congress for water resources improvements, including, in 1928, the Mississippi River & Tributaries Flood Control Act. Mention must also be made of Herbert Hoover who, as Secretary of Commerce and later President, accelerated the improvement of the Ohio and upper Mississippi, and had much to do with winning approval for the 1928 Flood Control Act because of his personal familiarity with the 1927 flood; which he followed from Cairo, Ill., to the mouth of Old River; almost getting caught in it when the railroad bridge over the Atchafalaya, at Melville, La., collapsed suddenly and disappeared in the brown swirling waters, just after he and his party stood on it looking at the Melville crevasse. Finally there is General Harley B. Fer-

Fig. 6
ARTICULATED CONCRETE REVETMENT
Close-up and General View—U. S. Army Engineer District, Memphis

guson, who literally "pushed the Mississippi around" until he got it into position for his successors to "nail down" by bank revetment (Figs. 5 and 6.)

Improvement by Use.

Any stream in constant use by traffic tends to maintain itself to a moderate degree. It does this by the scouring action, on crossings or shoals, generated by the means of propulsion. On a stream such as the Red River in Louisiana this could be important in the Packetboat days. Unquestionably the Red River, at that time, with a given volume of low water flow, was better than the unused Red River of today. Then too, such use inevitably results in a certain amount of snagging, either by the vessels themselves or as a result of their complaints. These are important and overlooked explanations for the navigability of certain small tributaries known to have carried traffic, and yet today conveying the impression that useful traffic could not possibly have moved thereon. It follows that such navigation employed drafts reasonably in consonance with the depths to be expected on the crossings and shoals in low water.

Navigation Improvements.

The first improvement work on the Mississippi, and most of its tributaries, was practically always snagging. A certain amount of rock removal and dredging was spasmodically undertaken at bad points. On the main stem of the Mississippi (i.e., from the mouth to Cairo, Ill.,) dredging became systematic with the inception of the Mississippi River Commission, and it

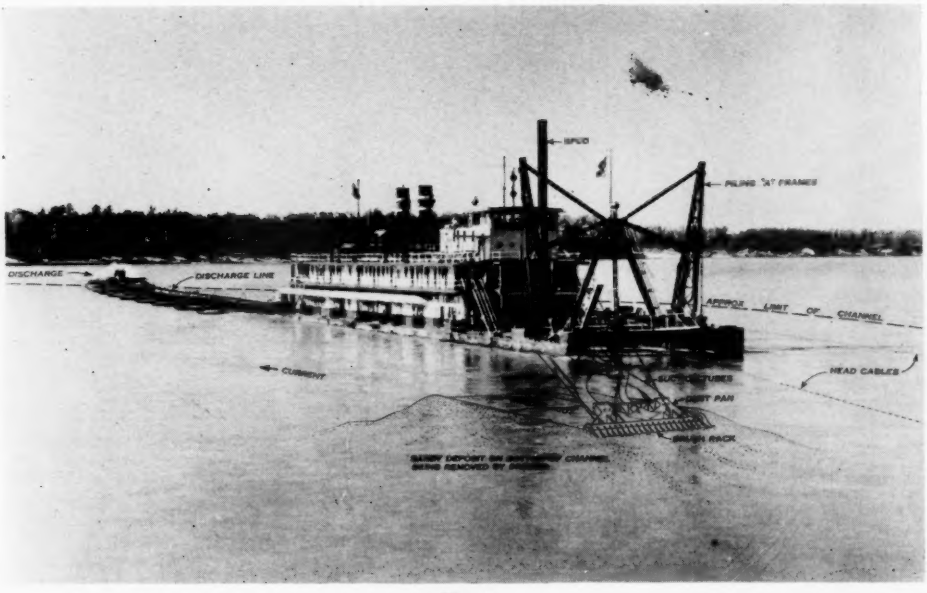

Fig. 7
"DUSTPAN" Dredge in Operation—U. S. Army Engineer District, Memphis

remains an important supplemental means of insuring navigation in low water; with this difference, today the aim is for a more liberal channel, as to depth and width, and delays to navigation that formerly would be overlooked are now considered intolerable (Fig. 7).

The first general improvement projects off the main stem of the Mississippi have depended, as to general design, on the nature of the river regimen; that is, non-alluvial rivers would generally be improved by lock and dam systems; the Ouachita and the Ohio, with its upper tributaries and the Tennessee, being examples. Rivers more truly alluvial would generally be improved by stabilization on their natural alignments; the inspiration being the work of Fargue, the French Engineer. Thus, the middle Mississippi, from Cairo, Ill., to mouth of the Missouri, was improved by revetting or protecting the bends, closing chutes and contracting from the convex side; all with a view to causing the river to deepen and to maintain its depth. Finally, one lock, at Chain-of-Rocks near St. Louis (Fig. 8), has proven necessary to eliminate the steep slopes and shoals associated with the presence of a rock bed. The upper Mississippi, from mouth of the Missouri to St. Paul, was being improved in the late 1920's under the "6-Foot Project." This "regulation" project, based on revetment and sand dikes, was well along, when the present lock and dam project was adopted as a result of Herbert Hoover's strong efforts. The Missouri has depended upon "stabilization;" that is, revetting the bends, contraction works from the convex bank to cause scour, and the closure of chutes. The present project was economically justified by working up benefits, over and above navigation, pertaining to the prevention of land losses, etc.

Comprehensive Stabilization.

A new approach to river stabilization stems from Gen. Harley B. Ferguson's work on the lower Mississippi from 1932

Fig. 8
CHAIN OF ROCKS LOCK—Main Lock 110' x 1200'
U. S. Army Engineer District, St. Louis

onward: Whereas stabilizing a stream on its natural alignment, following the French Engineer Fargue, produces improved navigation, the improvement contributes no other benefits, saving, of course, protection of public and private property from bank-caving and bar-building while, it does, on the other hand, increase flood heights moderately and interfere with drainage. Gen. Ferguson, instead of stabilizing the natural river, introduced a program of "Cut-offs and Corrective Dredging" to secure a greatly shortened, "gently-sinuous" alignment that will pass all discharges at considerably lower levels than the unimproved river. Gen. Ferguson's work, and the subsequent stabilization of the resulting improved alignment, was done not to "improve navigation" but primarily for "Flood Control." Thus, although the improved low water channel is perhaps the greatest "navigation improvement" yet made on the Mississippi, this result is incidental to the far-reaching reductions in flood heights, varying from as much as 16 feet near Arkansas City, Ark. to lesser amounts nearly down to Old River. As a practical navigation point, it may be remarked that the average upstream speeds of tows, on the shortened stretch of Mississippi River, are essentially the same in miles per hour as on the old unimproved river.

Such stabilization warrants the use of the word "comprehensive," and its economic analysis may be based on benefits of substantial magnitude under various of the

commonly recognized "water resources purposes"; the purposes to depend upon the local conditions on each particular river. A final advantage is that when such an alignment is stabilized by bank revetment, the improved river has a "built-in" tendency to hold its initial efficiency. Gen. Ferguson's concept has revolutionary implications for improving alluvial rivers all over the world.

GEOGRAPHICAL EXTENT OF MISSISSIPPI RIVER SYSTEM

The present extent of the existing and authorized Mississippi River System is shown on the map (Fig. 1). The system never remains static, not even for a decade, and underway at this time is a new system of locks on the Ohio which will greatly facilitate the Ohio's dense local and through traffic. At each site there will be an auxiliary lock and a main lock; the latter, 110′ x 1200′, is capable of passing intact the largest tows in ordinary use. Authorized and under construction is the Arkansas River project to provide for navigation to Tulsa (Catoosa), Okla. This waterway, running through an area of important natural resources and terminating in a most dynamic economic community, will probably contribute substantial traffic to the main stem. The Ouachita River is to be improved by providing greater depth and larger locks. While the Red River Lateral Canal in Louisiana, from the mouth to Shreveport, seems stalled at present, there is little doubt that a usable waterway will one day be planned and constructed, possibly to Daingerfield, Texas. The Intracoastal Waterway, which has exceeded in a fantastic way the traffic estimates upon which its economic justification was based, is in effect merely two artificial branches of the Mississippi; one east to Florida and one west to Mexico, both in sight of the Gulf of Mexico. A deepening of the Intracoastal beyond the present 12 feet is a possibility and perhaps, when this is done, a similar improvement of the main stem of the Mississippi may be engineeringly and economically feasible.

In recent years, there has been a series of "harbor developments" along the lower Mississippi to provide increased port facilities, off-river repair facilities and increased industrial frontage on the water. Such developments have taken place, or are under way, at Baton Rouge, La., Vicksburg and Greenville, Miss., and at Memphis, Tenn. The new Algiers Branch of the Intracoastal Waterway, and other developments at New Orleans, provide the same effect there. It now appears that the lower Mississippi, from some point just above the Head of the Passes to Baton Rouge, will become a continuous industrial area in the next several decades. This development, now well under way, will be firmly integrated with the entire system of trade and navigation on the Mississippi River System. This stretch of river is also to be developed for 40-foot draft ocean-going vessels in the very near future.

PRESENT TRADE DEVELOPMENT

It has been seen how the statesmen of the world's great powers understood the significance of the great Mississippi River System and jockeyed for its control. It has been seen how it was once the economic life-line of America and how it was allowed to decline to absolute insignificance, due largely to the unregulated monopolistic practices of the railroads. It has been seen how the U. S. Government, acting in its proper sphere, took effective steps to revive that traffic, and how private initiative, acting properly in its own sphere, has taken its lead from this government experiment and gone on to growth and development which seem endless. It is now in order to measure and compare the recent past and the present-day trade, and then go on to indicate what the future appears to hold.

As a first generalized summation, the

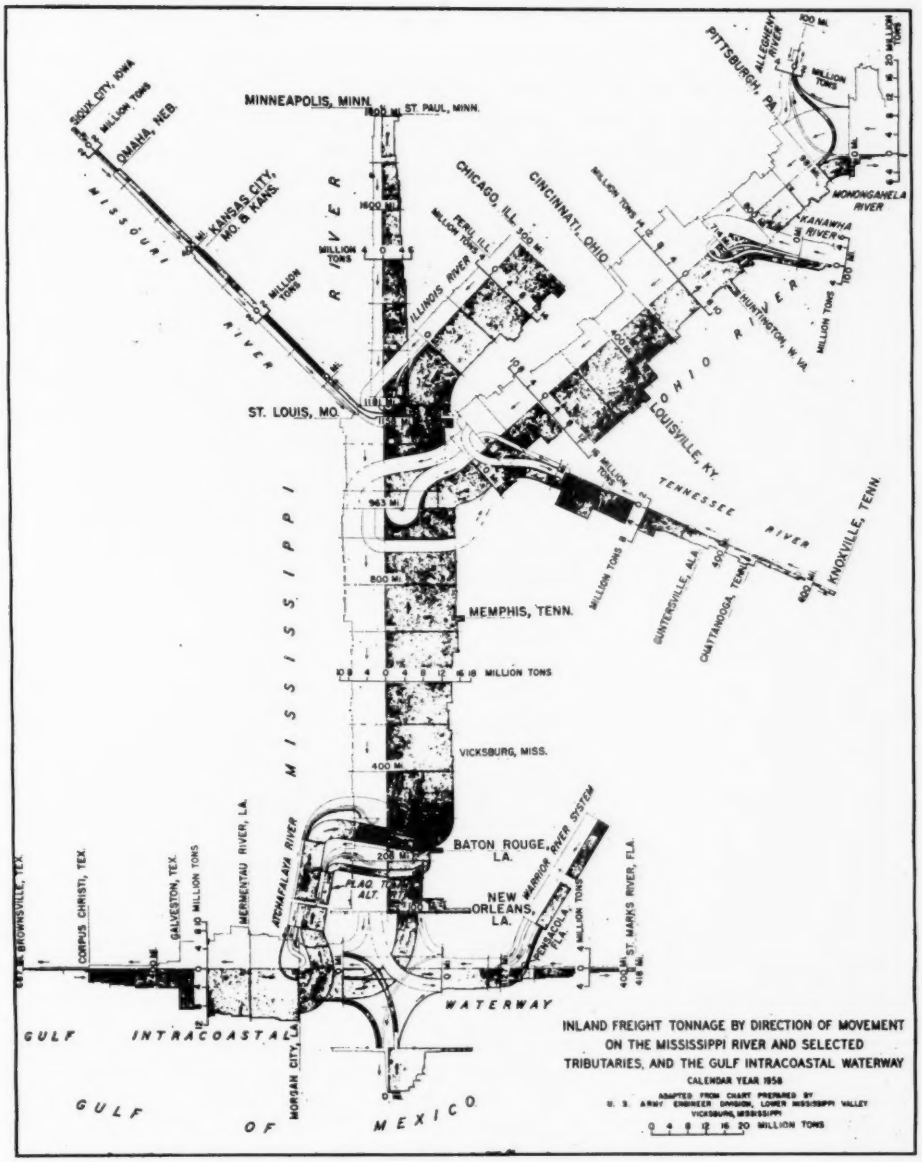

Fig. 9
U. S. Army Engineer Division, Lower Mississippi Valley

attached diagram* (Fig. 9) is presented. It shows the density of freight traffic handled over the Mississippi River System during the calendar year 1958. Since the east and west branches of the Gulf Intracoastal Waterway are in effect artificial tributaries, the chart treats this waterway as an integral part of the Mississippi River System.

The foregoing diagram furnishes a vivid picture of the recent heavy utilization of the Mississippi River System and its component navigation channels. It is now desirable to supplement the diagram and point up the overall rapid growth of the system by quoting some selected statistics. A review of available tonnage data has been made to select the best figures for this purpose. This review shows that, due to the radical increase in growth in the past two decades, the years prior to 1940 do not provide any meaningful comparison with the corresponding data for inland waterway shipping as it unfolds today. Accordingly, in the following statement, the tons and ton-miles of inland freight moved over the Mississippi River System (exclusive of the Gulf Intracoastal Waterway) in 1940 are compared with the corresponding figures for the calendar year 1958:

MISSISSIPPI RIVER SYSTEM

	1940	1958	Per cent Increase
Tons	73,173,711	172,581,949	136
Ton-miles	11,578,418,000	53,442,610,000	362

It is noteworthy that the increase in ton-miles has appreciably outpaced even the phenominal tonnage gains made by the Mississippi River System over the 18-year span documented. Actually, the average haul has rocketed from 158 miles per ton of freight carried in 1940 to 310 miles per cargo-ton shipped in the year 1958.

*Source: Diagram and all later statistical data, U. S. Army Corps of Engineers.

While net commodity statistics were not compiled for the entire Mississippi River System as far back as 1940, such information is available for internal commerce on the main Mississippi River itself. Accordingly, these tonnages have been employed in the table below. The growth picture in terms of these commodity groups is believed, in general, to be representative of the development that has occurred in the system as a whole. The table reports commodity group totals at three-year intervals from 1940 through 1958. Where the volume of a commodity moved in any year was less than a million tons, the item has been combined with the "all other" group.

Even without the gage provided by this growth pattern, the expanding investment, constantly being made in towboats and barge fleets, provides another indication of the expected increase in inland waterway traffic. The future of waterborne commerce is further bolstered by the established trend of chemical plants and other large basic materials consumers to gravitate into the "industrial complexes" now growing rapidly along the waterways. This type of plant requires, for its existence and development, bulk delivery and handling of raw materials and similar low cost bulk handling and distribution of the finished products. The Mississippi, considered as an integrated system, is uniquely suited to this development, now well under way and due to expand greatly as time goes on. Petroleum products too continue to move in ever greater volume and the increase in population and increased per capita use of motor vehicles seem to assure continuance of this trend. The expanded facilities

MISSISSIPPI RIVER (Internal commerce only)
Cargo commodities in thousands of tons

	1940	1943	1946	1949	1952	1955	1958
Petroleum and products	8,137	24,964	19,675	25,106	33,911	35,216	37,793
Coal and coke	—	—	1,011	1,221	1,808	3,742	6,151
Iron, steel and other metals	1,705	—	—	1,571	2,722	4,930	4,707
Grains and products	—	—	—	—	1,734	3,134	5,865
Forest products and paper	1,000	—	—	—	—	—	—
Sulphur	—	—	—	—	1,032	1,956	1,940
Sand and Gravel	1,216	—	—	2,806	4,398	3,908	4,734
Non-metallic minerals, n.o.s.	1,934	2,623	2,626	1,494	—	2,296	2,028
Chemicals and products	—	—	—	—	1,619	2,248	3,528
Sea animal shells	—	—	—	—	—	1,810	3,285
All other commodities	2,574	3,230	2,882	5,034	5,910	4,198	5,249
Total	16,566	30,817	26,194	37,232	53,134	63,438	75,280

for handling grain along the inland waterway system, the spreading markets for coal spurred on by construction of steam power plants, the phosphates from Florida fanning out water-wise through the mid-continent, and the decentralization of the aluminum industry are all factors lending impetus to the growth of traffic on the Mississippi River System.

And now it seems almost assured that this great river system will again occupy a position in American life comparable in economic importance with that at the height of the Packetboat era. At that time, the Mississippi was only an avenue for moving the products of farm and mine and the goods for local consumer trade. Now, in addition to its use as a main avenue of imports and exports to and from the American heartland, it is the very basis for the great industries described above, whose existence is tied directly to water transport for raw materials and for the distribution of finished products. The figures for present traffic may be viewed against this background, with the assurance that they will be multiplied, decade after decade, as far as one's vision is allowed to stray.

Although the St. Lawrence System of Waterways is great, and will be greater, the statement will be ventured that it can never equal in importance this unique river system, which, as industry expands, traffic develops, and new river improvements materialize, will go on and on, with nothing in America, or anywhere in the world, on a comparable scale as to volume or as to national economic significance.